

1. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 + 26x^2 - 33x - 36}{16x^2 - 8x - 15}$$

- A. Vertical Asymptotes of $x = 1.25$ and $x = -0.75$ with no holes.
 - B. Vertical Asymptotes of $x = 1.25$ and $x = 1.5$ with a hole at $x = -0.75$
 - C. Vertical Asymptote of $x = 0.5$ and hole at $x = -0.75$
 - D. Holes at $x = 1.25$ and $x = -0.75$ with no vertical asymptotes.
 - E. Vertical Asymptote of $x = 1.25$ and hole at $x = -0.75$
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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 11x^2 - 45x - 50}{6x^2 + x - 15}$$

- A. Holes at $x = 1.5$ and $x = -1.667$ with no vertical asymptotes.
 - B. Vertical Asymptote of $x = 1.5$ and hole at $x = -1.667$
 - C. Vertical Asymptotes of $x = 1.5$ and $x = -1.667$ with no holes.
 - D. Vertical Asymptote of $x = 2.0$ and hole at $x = -1.667$
 - E. Vertical Asymptotes of $x = 1.5$ and $x = -1.25$ with a hole at $x = -1.667$
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3. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 17x^2 - 14x - 15}{12x^2 + x - 6}$$

- A. Vertical Asymptotes of $x = 0.667$ and $x = -0.75$ with no holes.
- B. Vertical Asymptote of $x = 1.0$ and hole at $x = -0.75$
- C. Vertical Asymptote of $x = 0.667$ and hole at $x = -0.75$

- D. Vertical Asymptotes of $x = 0.667$ and $x = -1.667$ with a hole at $x = -0.75$
- E. Holes at $x = 0.667$ and $x = -0.75$ with no vertical asymptotes.
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4. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 + 18x^2 - 15x - 25}{12x^2 - 31x + 20}$$

- A. Vertical Asymptotes of $x = 1.333$ and $x = -2.5$ with a hole at $x = 1.25$
- B. Vertical Asymptotes of $x = 1.333$ and $x = 1.25$ with no holes.
- C. Holes at $x = 1.333$ and $x = 1.25$ with no vertical asymptotes.
- D. Vertical Asymptote of $x = 0.667$ and hole at $x = 1.25$
- E. Vertical Asymptote of $x = 1.333$ and hole at $x = 1.25$
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5. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 + 25x^2 - 4x - 12}{4x^2 + 23x + 15}$$

- A. Oblique Asymptote of $y = 3x - 11$.
- B. Horizontal Asymptote of $y = 3.0$
- C. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 11$
- D. Horizontal Asymptote of $y = -5.0$ and Oblique Asymptote of $y = 3x - 11$
- E. Horizontal Asymptote at $y = -5.0$
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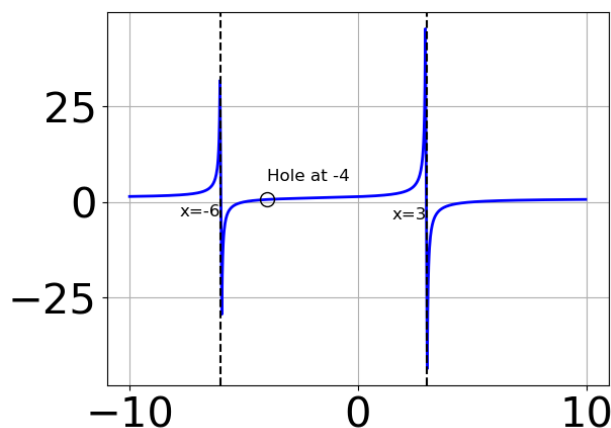
6. Determine the horizontal and/or oblique asymptotes in the rational

function below.

$$f(x) = \frac{12x^3 + 83x^2 + 165x + 100}{3x^3 - 5x^2 - 65x - 100}$$

- A. Vertical Asymptote of $y = -4$
- B. None of the above
- C. Horizontal Asymptote of $y = 0$
- D. Horizontal Asymptote of $y = 4.000$
- E. Vertical Asymptote of $y = 5.000$

7. Which of the following functions *could* be the graph below?



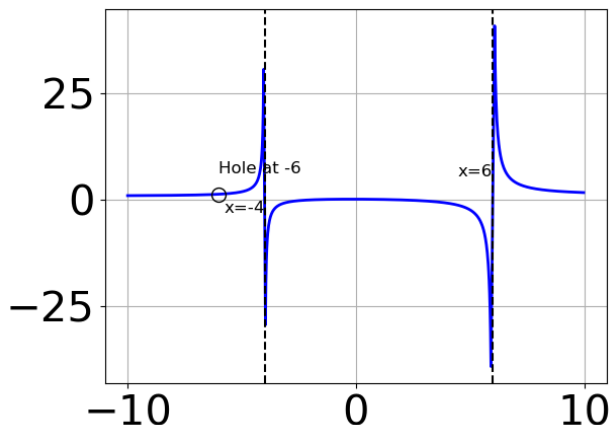
- A. $f(x) = \frac{x^3 - 5.0x^2 - 25.0x + 125.0}{x^3 - 7.0x^2 - 6.0x + 72.0}$
- B. $f(x) = \frac{x^3 - 5.0x^2 - 25.0x + 125.0}{x^3 + 7.0x^2 - 6.0x - 72.0}$
- C. $f(x) = \frac{x^3 + 4.0x^2 - 25.0x - 100.0}{x^3 + 7.0x^2 - 6.0x - 72.0}$
- D. $f(x) = \frac{x^3 - 4.0x^2 - 25.0x + 100.0}{x^3 - 7.0x^2 - 6.0x + 72.0}$
- E. None of the above are possible equations for the graph.

8. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{5x^2 + 27x + 10}{15x^3 + x^2 - 12x - 4}$$

- A. Horizontal Asymptote of $y = 0.333$ and Oblique Asymptote of $y = 3x - 16$
- B. Horizontal Asymptote at $y = -5.000$
- C. Horizontal Asymptote of $y = 0$
- D. Oblique Asymptote of $y = 3x - 16$.
- E. Horizontal Asymptote of $y = 0.333$

9. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 - 2.0x^2 - 4.0x + 8.0}{x^3 - 4.0x^2 - 36.0x + 144.0}$
- B. $f(x) = \frac{x^3 - 6.0x^2 - 4.0x + 24.0}{x^3 - 4.0x^2 - 36.0x + 144.0}$
- C. $f(x) = \frac{x^3 + 6.0x^2 - 4.0x - 24.0}{x^3 + 4.0x^2 - 36.0x - 144.0}$
- D. $f(x) = \frac{x^3 + 3.0x^2 - 4.0x - 12.0}{x^3 + 4.0x^2 - 36.0x - 144.0}$
- E. None of the above are possible equations for the graph.

10. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{4x^3 - 8x^2 - 25x + 50}{2x^2 - x - 10}$$

- A. Horizontal Asymptote of $y = 2.0$
 - B. Horizontal Asymptote of $y = -2.0$ and Oblique Asymptote of $y = 2x - 3$
 - C. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 3$
 - D. Oblique Asymptote of $y = 2x - 3$.
 - E. Horizontal Asymptote at $y = -2.0$
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